DOCUMENT RESUME

ED 477 038 IR 021 766

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TITLE Reshaping Curricular Culture.

PUB DATE 2002-06-00

NOTE 7p.; In: ED-MEDIA 2002 World Conference on Educational Multimedia, Hypermedia & Telecommunications. Proceedings (14th, Denver, Colorado, June 24-29, 2002); see IR 021 687.

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PUB TYPE Reports - Evaluative (142) -- Speeches/Meeting Papers (150)

EDRS PRICE EDRS Price MF01/PC01 Plus Postage.

DESCRIPTORS Academic Standards; *Computer Uses in Education; Cooperative Learning; *Curriculum Development; *Educational Development; Educational Objectives; Educational Technology; Higher Education; Instructional Development; Problem Solving; Student Motivation; *Teacher Education; *Technology Integration

ABSTRACT

Curricular goals that traditionally focused on the delivery of the teaching rather than the outcomes of the learning are in a state of major transition. Implementation of academic standards requires the application of content and not merely its delivery. As a result, colleges of education must prepare anew genre of teacher leaders equipped to align students' classroom experiences with the changing realities of performance learning in an information era. This paper focuses on preparing teachers who can link electronic information resources with engaging learning experiences. The work is grounded in the beliefs of cognitive theory and applied practice. It presents educational media as a support structure in the curricular architecture of teaching and learning rather than as an ancillary element. It specifically focuses on preparing educators to motivate their students through comparative, investigative, and collaborative problem solving. (Contains 18 references.) (Author)

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RESHAPING CURRICULAR CULTURE

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ABSTRACT

Curricular goals that traditionally focused on the delivery of the teaching rather than the outcomes of the learning are in a state of major transition. Implementation of academic standards requires the application of content and not merely its delivery. As a result, colleges of education must prepare a new genre of teacher leaders equipped to align students' classroom experiences with the changing realities of performance learning in an information era. This presentation focuses on preparing teachers who can link electronic information resources with engaging learning experiences. The work is grounded in the beliefs of cognitive theory and applied practice. It presents educational media as a support structure in the curricular architecture of teaching and learning rather than as an ancillary element. It specifically focuses on preparing educators to motivate their students through comparative, investigative, and collaborative problem solving.

1. INTRODUCTION

Words such as excellence, quality, equity, and opportunity dominate the rhetoric of school reform. But behind the words is a serious confrontation to rethink how we organize learning opportunities. Possibly nothing has more dramatically challenged curriculum construction than the accessibility and availability of electronic resources.

Much of my work over the last decade has addressed educational change in

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de-Sovietizing environments in East Central Europe. In that transitional time I observed teachers, administrators, and policy makers struggling with what they called the 'tunnel at the end of the light.' In this frequently used metaphor, the light symbolized political changes that externally were cause for celebration. The tunnel symbolized the internal challenges and the new mismatch of learning and life. For although simultaneous political, economic, and educational transitions created new opportunities, they also created new challenges regarding the organization of schooling and the acquisition of information. Presently my work environment is an American college of education. But although the geography of my attention has shifted, the circumstances that influence new alignments between school and society is marked by similar uncertainty regarding the realignment of learning experiences in a digital era.

2. GOALS OF TECHNOLOGICAL IMPROVEMENT: AN ISSUE OF USE

Policy makers in many nations portray social transitions to an information era and school improvement as associated concerns. As a result, schools on a global basis are in the midst of technology related reforms and their associated challenges. Linda Darling-Hammond (1997, p.2) aptly captures the cultural climate of this transitional time:

> "Never before has the success, perhaps even the survival, of nations and people been so tightly tied to their ability to learn. Consequently, our future depends now, as never before on our ability to teach."

The teachers at the core of these changes are realizing, however, that successful past practices may be incongruent or even obsolete in electronically rich environments. If teachers are indeed "navigators" (Bruer, 1994) into the future, then the altered fit of technology, teaching, and learning presents a contemporary navigational challenge.

The scope of technologies that have historically impacted education is vast. This work concentrates only on one technology that has dramatically altered available resource information in the past decade, the Internet. Although the Internet provides a powerful platform for accessing information, the educational impact of that body of information is dependent on its use.

3. DILEMMAS REGARDING TECHNOLOGY INVESTMENT

At both national and community levels, increasing expenditures are being appropriated to enhance student learning through technology. But unless such efforts give adequate attention to the changing alignment between resources and applied knowledge, such expenditures are questionable (Dede, 1997).

American studies indicate that over seventy-five percent of the general

public believe that technology improves both teaching and learning (Trotter, 1997). But teachers who have Internet access do not necessarily change their pedagogical strategies (Johnston, 1997). And student learning does not increase in relationship to time spent with electronic resources, but rather in the manner in which new information is linked to problem solving (ETS, 1998). If we contemplate similar relationships for networked learning without attention to how teachers can most effectively use this resource as a means to better thinking, access to vast information banks may have limited impact on student achievement. So what should we do differently? Papert (1998) contends that we must stop trying to merely improve current practices, that we must fundamentally change how we organize learning opportunities to incorporate technological tools rather than teaching about them.

4. CHALLENGES TO EFFECTIVE TEACHING AND LEARNING

Studies indicate that while most teachers have incorporated technology's storage capabilities, they have not fully capitalized on its capacity to motivate knowledge construction and to facilitate problem-solving (Nicaise and Barnes, 1996; Perkins, 1992a). These two elements, constructing new knowledge and engaging students in the application of information to problem solving, are the focus of the following examples that share the use of Internet resources in a manner that is interesting, sustaining, and rewarding for both student and teacher.

5. SAMPLE EXPERIENCES BASED ON ELECTRONIC RESOURCES

Because of the dire statistics about American teachers' knowledge of geography, these examples grew from a core assignment requiring teachers to construct new knowledge about a global region about which they previously knew little or nothing. The follow-up assignment involved translating their new learning as adults into problem related experiences for students. Several examples follow.

In an electronic trip to France, one educator used her own new knowledge about art as a means to motivate the construction of historic and cultural knowledge that incorporated a multitude of Internet museum sites. Through focusing on a selection of chosen works of Impressionist art, she asked her students to hypothesize about the cultural climate of that era. Students themselves were then required to explore additional sites to gather more information through which they could support or negate ideas they had formulated. An extension opportunity encouraged students to further examine the life and work of an artist of their choice and compare it with the same art forms on other continents during that time frame.

An electronic field trip to Poland enabled another teacher to inspire his students to create comparative journals for an American teen living in the

Appalachian Mountains and a Polish teen in the Carpathian Mountains. Resources reprinted from the Internet ensured that students would have accurate data for this literacy-based activity that integrated written communication skills with geological and cultural information sources.

Another prospective educator used her electronic trip to Switzerland as the foundation for an innovative health unit that examined the effects of altitude on the human body. An electronic field trip to Kenya led to a lesson that asked students to first use Internet resources to explore actual habitats and then use data to assess whether community proposals for a new wildlife sanctuary were scientifically grounded. A less traditional journey involved applying Internet learning from the NASA site to design a playground in space addressing the particular problem solving challenges in building a playground in zero gravity.

A final case exemplifies how teachers can use Internet resources to motivate the synergy that results when students assume not only greater responsibility for their individual learning, but also contribute in a manner in which the whole class benefits from the combined efforts of its members. Their teacher used Internet resources to explore the themes of economic production, distribution, and consumption and to apply them in environmental relations within ecosystems. Students discovered how bacterium in geysers contributes to medical research on Lyme disease and AIDS, and they evaluated conflicting interests introduced by mining and the economic needs of communities surrounding protected environmental areas. As a follow up on the economic effects of oil spills, students used the Internet to share findings about how negative circumstances such as environmental disasters for some populations can create opportunity for other groups, such as new financial markets in environmental clean-up.

Traditionally, when teachers sent students to the library for independent research, most came back with similar information from the same basic sources. The richness of electronic resources provides opportunity for more expansive and encompassing learning opportunities for students if their teachers rethink the traditional construction of teaching and learning experiences.

6. FINDINGS AND CONCLUSIONS

Although no generalizations regarding variances in academic achievement can be drawn from these examples implemented in different school settings, one recurrent comment from other educators who observed and supervised the redesigned use of resources was how they enabled students to target particular standards for the social studies with greater clarity. Of ten particular national

standards for the social studies, four performance areas were noted as being apparent to students. These were: 1) global connections, 2) time, continuity, and change, 3) people, places, and environments, and 4) production, distribution, and consumption.

The manner in which teachers align technology with curricular goals is largely dependent on the beliefs and experiences established in teacher preparation programs. If graduates of universities and colleges are to be effective navigators for their students, then they must become comfortable and competent in transforming large networks of mere information into significant problem solving experiences.

The process of redesigning the learning process in any nation must begin with the adult learners, the teachers. In order for educational change to be institutionalized it must be part of the teachers' foundational competencies (Hargreaves, 1992, Greenfield, 1995, Fullan, 1993). Just as successful businesses need workers who are better thinkers, so too do educational enterprises need both learners and leaders who use technology to become better thinkers (Crouter and Manke, 1994). These projects reflect the juxtaposition of electronic information and the thinking process. They use computers for what they do best, storage and organization, and the human mind for what it does best, judging, interpreting, analyzing, synthesizing, and constructing meaning (Jonassen, 1995). They present ideas that foster connections between information and thinking rather than fragmented and isolated approaches that mark failed educational changes (Fullan, 1996).

Although the long-term impact of cyberspace learning on student achievement is yet to be determined, the integration of Internet resources gives teachers the opportunity to significantly alter curricular construction.
While the Internet has the potential to bring the world into the classroom, quality teaching results from quality thinking. Teachers who successfully navigate journeys into more electronic environments are those whose old way of thinking become transformed and who see themselves as both learners and leaders, as change agents, and as individuals who can consistently add value to their profession.

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